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worker and the investigator in field, garden, or greenhouse, felt the need of some reliable work dealing in a plain way with the principles and practice involved in economical plant feeding. Such a work has been supplied by Professor Voorhees,⁵ who has the happy faculty of telling what one wants to know, and telling it briefly. One is told what to do and given a reason for doing it, and due consideration is given to modifications required by special or unusual conditions.

The description of fertilizing material is up to date, and the formulas recommended for special crops are those that have been profitable in actual use; not the oft-reprinted ones that can be traced back only to advertising matter.

In addition to the specific information in regard to feeding plants, the botanist will doubtless welcome the clear, brief summary of the several broad systems of fertilization that have been proposed and advocated at great length by their authors.

The author is too genial to be accused of being a philosopher; but here and there he drops a remark that sets one to thinking of the broad questions involved in the production of plants, and then speedily leads one to see how the principles discussed can be reasonably and profitably applied.

The book will receive a hearty welcome from both investigator and farmer.
—H. A. HUSTON.

MINOR NOTICES.

THE FIRST NUMBER of *Rhodora*, the journal of the New England Botanical Club, has made its appearance. The editorial staff is as follows: B. L. Robinson, editor-in-chief; F. S. Collins, M. L. Fernald, and H. Webster, associate editors; W. P. Rich and E. L. Rand, publication committee. The purpose is tersely stated as follows: "This journal is founded by the New England Botanical Club, with confidence that it will give new stimulus and render material aid to the study of our local flora. . . . In the selection of subject-matter, special attention will be given to such plants as are newly recognized or imperfectly known within our limits, to the more precise determination of plant ranges, to brief revisions of groups in which specific and varietal limits require further definition, to corrections upon current manuals and local floras, to altitudinal distribution, plant associations, and ecological problems."

The first number contains the following papers: "Rattlesnake plantains of New England," by *M. L. Fernald*; "Saniculas of western Vermont," by

⁵ VOORHEES, EDWARD B. — Fertilizers: The source, character, and composition of homemade and manufactured fertilizers; and suggestions as to their use for different crops and conditions. 12mo. pp. xiv + 335. New York: The Macmillan Company. 1898. \$1.00.

E. Brainerd; "Notes on algæ," by *F. S. Collins*; "A prolific gentian," by *W. Deane*; "Myosotis collina in New England," by *E. F. Williams*; "A new wild lettuce from Massachusetts," by *B. L. Robinson*; "Notes on some fleshy fungi found near Boston," by *H. Webster*; "Matricaria discoidea in eastern Massachusetts," by *W. H. Manning*; besides shorter miscellaneous notes.

There is need for just such journals, and *Rhodora* is certain to fill its mission. The GAZETTE congratulates the editors upon the appearance of the initial number, and wishes the new venture great success. — J. M. C.

THE FIRST PART of a work on the physiology of plant organization has recently been published by Professor Dr. G. Berthold,⁶ of the University of Göttingen. No criticism of this part is possible, since it is merely a record of the observations of the author regarding (1) the anatomy of the Scitamineæ, (2) the anatomy and development of certain Compositæ, Umbelliferæ, and Araliaceæ; (3) the annual shoots of *Acer Pseudoplatanus*; (4) the development of some roots and axes of Pandanaceæ and palms; (5) the structure and development of leaves and stems; (6) the red coloration of leaves and stems; (7) the dying of leaves and stems.

The discussion of the observations is promised in the second part which is to appear very soon. That may be expected to show reason for the publication of what, unexplained, seem like trivial details, proper enough in a notebook, but unusual in print. The record shows an enormous amount of work, for which we are ready to express gratitude as soon as we know what it means.—C. R. B.

NOTES FOR STUDENTS.

SOME USEFUL physiological data regarding the rate of growth, flowering, nutrition, and transpiration of *Nelumbo nucifera* Gært. are recorded (in English) by Mr. K. Miyabe in Tokyo Botanical Magazine 12:85-101, 112-117. 1898.

AT A MEETING of the botanical section of the Russian Society of Naturalists at Kiew, August 1898, Professor S. Nawaschin spoke upon his new observations on fertilization in *Fritillaria* and *Lilium*. He has found true cellulose membranes on all three cells of the sexual apparatus, which were resorbed before the entrance of the sperm nucleus into the embryo sac. Both sperm cells, he asserts, enter the embryo sac, one of them penetrating the egg, while the other copulates with the nearer polar nucleus! The latter then copulates with the other polar nucleus. The brief abstract (Bot. Cent. 77: 62. 1899) does not give further details and Nawaschin's interpretation of what

⁶ BERTHOLD, G.—Untersuchungen zur Physiologie der pflanzliche Organization. Erster Teil. 8vo., pp. iv + 242, *pl. 1*. Leipzig: Wilhelm Engelmann. M 6.